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Kendig, Hal; Dykstra, Pearl A.; Gaalen, Ruben I. van; Melkas, Tuula

Published in:
Journal of Family Issues

DOI:
[10.1177/0192513X07303896](https://doi.org/10.1177/0192513X07303896)

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Document Version
Publisher's PDF, also known as Version of record

Publication date:
2007

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Kendig, H., Dykstra, P. A., Gaalen, R. I. V., & Melkas, T. (2007). Health of Aging Parents and Childless Individuals. *Journal of Family Issues*, 28(11), 1457. <https://doi.org/10.1177/0192513X07303896>

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Journal of Family Issues

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Journal of Family Issues 2007; 28; 1457

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Health of Aging Parents and Childless Individuals

Hal Kendig

The University of Sydney, Australia

Pearl A. Dykstra

Ruben I. van Gaalen

Netherlands Interdisciplinary Demographic Institute, The Hague

Utrecht University, Netherlands

Tuula Melkas

Statistics Finland, Helsinki

This article reviews and presents research findings on the relationships between parenthood and health over the life span. Existing research shows lacunae. The links between reproductive behavior and longevity generally focus on family size rather than contrasting parents and nonparents. Studies of marital status differentials in survival generally confound the effects of parenthood and marital status. Studies of the effects of multiple roles (combining parenthood, marriage, and employment) have the drawback that parenthood is equated with currently having children in the home. The authors provide new evidence on the health of people who have reached old age, contrasting those with and without children, in an attempt to tease out the effects of parenthood, marital status, and gender. Data from Australia, Finland, and the Netherlands are used. Insofar as parenthood effects are found, they pertain to health behaviors (smoking, alcohol consumption, and physical exercise), providing evidence for the social control influences of parenthood.

Keywords: *childlessness; health; health behaviors; marital history; parenthood; social control*

To gain insight into sources of inequality in society, we examine differences in health between aging parents and childless individuals. Insight into the health-compromising and health-promoting aspects of parenthood as it extends into later life will contribute to our knowledge about cumulative and compounding influences over many decades of experience. Historical and comparative perspectives can shed light on possible social structural influences on health through the life span.

In the first part of this article, we provide a critical review of relevant literature. Different bodies of research touch on issues linked with parenthood differences in health; however, the implications of being childless for late-life health are typically not addressed. We show that existing research has had substantive foci that are of relevance to issues of childlessness; however, the question of health differences linked with nonparenthood has rarely been addressed directly. We review studies from three research traditions: (a) reproductive history and longevity, (b) marital status and health, and (c) multiple roles and health. In the second part of this article, we present findings from three countries (Australia, Finland, and the Netherlands) on the health of older parents and nonparents.

Review of Relevant Literature

Reproductive History

We start by reviewing studies of the links between reproductive history and longevity. Three strands of theorizing can be identified in this body of literature. The first involves the explanation of the *U*-shaped pattern that has emerged in many studies of the association between parity and all-cause mortality. Typically, these studies are based on people identified by their demographic characteristics obtained from census data with follow-up information from death registers. A consistent finding of these prospective studies is that ever-married women with no or only one child and those with five or more children have relatively high mortality rates, whereas women with two to four children have lower mortality rates (Hurt, Ronsmans, & Thomas, 2006). This pattern has been observed in the United States for ever-married women age 45 years and older (Kitagawa & Hauser, 1973) and in two studies of women in Norway (Kvåle, Heuch, & Nilssen, 1994; Lund, Arnesen, & Borgan, 1990). The relationship between parity and marital status was

Authors' Note: The findings reported in this article are from the 1992-1993 Australian Longitudinal Study of Aging (ALSA), which was funded by the U.S. National Institute on Aging and the South Australian Health Commission; the 1994 Health Status of Older People Survey, which was funded by the Victorian Health Promotion Foundation; the 1994 Survey of Living Conditions in Finland (SFLC) that was carried out by Statistics Finland; and the 1992-1993 Longitudinal Aging Study Amsterdam (LASA), which is funded by the Dutch Ministry of Health, Welfare and Sport. We would like to thank Marja Jylhä, Tanya Koropeckyj-Cox, and Renske Keizer for their thoughtful suggestions. Please address correspondence to Hal Kendig, Research Professor of Ageing and Health, Faculty of Health Sciences, University of Sydney, c/o CERA, Concord Hospital C25, Concord, NSW 2139, Australia; e-mail: h.kendig@usyd.edu.au.

also confirmed in England and Wales (Doblhammer, 2000; Green, Beral, & Moser, 1988; Grundy & Tomassini, 2005) and Austria (Doblhammer, 2000).

Post hoc explanations advanced for the higher mortality rates of low-parity women tend to center on selection effects as to who marries or has children (Green et al., 1988; Kitagawa & Hauser, 1973). The most common argument is that low parity is a sign of subfecundity or sterility, both of which in turn are linked to poor health and higher mortality. Women might also restrict their number of childbirths because of their health: The 1946 British cohort study (Pless, Cripss, Davies, & Wadsworth, 1989) found that women who had been chronically ill at ages 21 to 25 were less likely to have children compared with their healthy counterparts. A posited causal effect is that the higher mortality rates of high-parity women may arise from the adverse physiological effects of multiple pregnancies (Kvåle et al., 1994). Green et al. (1988) provided examples of health conditions in which risks are heightened by pregnancy (see also Beral, 1985; Friedlander, 1996). It is known that pregnancy can trigger diabetes (starting with gestational diabetes) and degenerative changes in arterial walls; repeated pregnancies might increase the risk of ischemic heart disease. Toxemia of pregnancy might also make women more susceptible to hypertension and its complications and its ongoing effects.

The excess mortality of high-parity women is consistent with a second strand of theorizing, which takes an evolutionary framework as its point of departure. The disposable soma theory on the evolution of aging (Kirkwood, 1977; Kirkwood & Holliday, 1979) states that there is a trade-off between longevity and reproduction. Longevity involves significant metabolic costs in the form of investments in somatic maintenance. Reproduction makes use of resources that could be used for the maintenance and repair of cells and thus competes for resources, with faster aging as a result. Using historical, genealogical data on ever-married men and women of the British aristocracy born between 700 and 1876, Westendorp and Kirkwood (1998) demonstrated that there was an inverse relationship between the age at death and the number of children ever born among women who lived to age 60 and older. It is surprising to note that a similar pattern was observed for men. Another intriguing finding was that almost half of the married women who survived to age 81 or older had no children at all. Although these findings are consistent with the disposable soma theory, they do not go very far in suggesting specific explanatory mechanisms as to disease pathways that could affect differential survival.

The Westendorp and Kirkwood (1998) study has been subject to criticism (Doblhammer & Oeppen, 2003; Gavrilova & Gavrilova, 1999; Le Bourg,

2001). In their analysis of a more complete genealogy of the British aristocracy than the one used by Westendorp and Kirkwood, Doblhammer and Oeppen (2003) confirmed that the number of children was positively associated with mortality levels for women who lived to age 50 and older; however, they found no statistically significant differences for men. Dribe (2004), using family reconstitution data from West Sweden for the period 1766 to 1895, also reported a negative influence of parity on longevity after age 50 among married women. Again, no associations between the number of children ever born and longevity were found for men. These historical studies pertained to time periods prior to the demographic and epidemiological revolutions that led to sharp reductions in childbearing rates and death rates.

The inverse relationship between parity and longevity has also been reported for contemporary populations. Survivorship data of men and women born between 1880 and 1929 who had participated in the Rancho Bernardo Heart and Chronic Disease Survey showed that women with relatively more children born had higher mortality than those who were childless or had few children (Friedlander, 1996). Among men, no association between reproduction and survivorship was found. It is possible, however, that the findings might be specific to this exclusive community in Southern California where the people were relatively affluent and had high levels of childlessness (more than 30%).

A third strand of theorizing focuses on the excess mortality of childless and low-parity women in contemporary populations. As described previously, one possible mechanism may be the role of health as a selection factor in marrying or having children. An alternative explanation draws attention to the hormonal protection against genital and other sex-specific cancers that is provided by pregnancy: In a prospective study of Norwegian women, the risk of cancers of the breast, uterus, and ovary was shown to be inversely related to the number of births (Kvåle et al., 1994). A British epidemiological study also reported higher mortality from breast, ovarian, and endometrial cancer among ever-married childless women compared to ever-married mothers (Beral, 1985). Although multiple pregnancies may have a negative impact on health by triggering dormant pathological conditions, hormonal changes associated with pregnancy may have a positive impact by reducing the risk of specific types of cancer.

In summary, studies based on 20th-century populations show that all-cause mortality is higher among childless women than among mothers, with the exception of women with relatively large families (five or more children). Health selection and poorer protection against hormonally related cancers

are the dominant explanations advanced for the excess mortality among childless women. However, research on the associations between reproductive history and longevity is generally restricted to ever-married women. The interrelations of reproductive and marital histories and their impacts on mortality are generally not considered. Relatively few studies have included men in their samples. Another drawback is that a focus on number of children can aggregate the childless in a low-parity group. A better understanding of the interlinkages between reproductive history and longevity requires individual-level data on full fertility histories and full medical histories through time.

Marital Status

The second body of literature that we consider involves marital status differentials in health (e.g., Ben-Shlomo, Smith, Shipley, & Marmot, 1993; Joung, 1996; Verbrugge, 1979; Waite & Gallagher, 2000), often using mortality as the outcome measure. However, as marriage and parenthood are inherently linked, it is difficult to disentangle them. Usually, parenthood is examined only indirectly.

One of the most influential contributions in this literature is Gove's (1973) article in the *American Journal of Sociology*. The basic premise is that variations in mortality rates arise from the psychological states and lifestyles associated with the marital role. Gove argued that the married, compared to the unmarried, (a) have higher psychological well-being and thus a lower likelihood of death by suicide, homicide, and accidents; (b) are less likely to engage in self-destructive acts and thus are less likely to die from, for example, alcohol-related causes; and (c) are more willing and able to undergo the treatment required for diseases such as tuberculosis and diabetes. Using data from the U.S. National Center for Health Statistics, Gove showed that for each of these causes of death, the married had substantially lower mortality rates than the unmarried.

The marital status differences in mortality were found by Gove (1973) to be systematically larger for men than women (see also Berkman & Syme, 1979; Brockmann & Klein, 2004; Cheung, 2000; Hu & Goldman, 1990; Joung, 1996; Lillard & Waite, 1995). Among men, the formerly married had higher mortality rates than the never married. Among women, the mortality rates of the formerly and never married were quite similar. The marital status disparities were greatest in the age 25 to 44 range. Gove noted that these ages correspond closely to the time when most families have young children in the home and, following Durkheim (1896/1951), suggested that having children

might provide a form of protection through their effect on the concerns and behavior of parents.

The explanations offered for marital status differentials in health broadly divide into those based on health selection and those related to social causation (e.g., Joung, 1996; Kobrin & Hendershot, 1977; Wyke & Ford, 1992). *Health selection* implies that people with health problems (and fewer resources generally) have lower probabilities of marrying, staying married, and remarrying. Health differences between the married and the unmarried may therefore not be attributable to marriage per se but rather to the characteristics of the people who are likely to marry and to remain married. *Social causation* implies that marriage has a positive protective effect and that the health advantages of the married are attributable to better material resources, avoidance of risky health behavior, better coping resources, a lower susceptibility to stress, and higher levels of available support. For the formerly married, the stress accompanying the breakup or loss of the relationship also can have adverse health consequences. Research findings indicate that selection and causation explain part of the marital status differences in health and psychological well-being (Brockmann & Klein, 2004; Joung, 1996; Mastekaasa, 1992; Simon, 2002; Weitoft, Burström, & Rosén, 2004).

The design of health studies seldom allows us to disentangle parenthood and marital status effects. Notable exceptions do exist, however. For example, Høyer and Lund (1993) linked data from the 1970 census in Norway to death certificates for the years 1970 to 1985. Information on parity was available only for the current marriage of women at the time of the census. The authors restricted their analyses to suicide among women who were either never-married or married at baseline, and age 25 and older. Among those age 25 to 64 at baseline, the risk of death from suicide was higher among never-married women than among married women, regardless of whether they had children. Among married women, childlessness was associated with a higher rate of suicide in each age group. However, in the age group of 65 to 74 at baseline, there was an apparent "crossover" effect with the suicide mortality rate of never-married women being lower than that of childless married women. Høyer and Lund's findings suggest that childless women are more prone to suicide and the more so if they are never-married and younger than age 65.

Combining data from the 1985 and 1990 censuses, national health registers, and a register of known biological relations between parents and children, Weitoft et al. (2004) distinguished the effects of ever having fathered a child, living with one or more biological children, and living with a partner on the longevity of Swedish men age 29 to 54. The highest all-cause mortality was observed among single noncustodial fathers, closely

followed by single childless men. These differences were only partially attributable to health selection (as indicated by the men's previous inpatient history) and to differences in socioeconomic status. A reduced risk of all-cause mortality was also observed among childless men living with a partner, again after controlling for health selection effects and socioeconomic status. The lowest all-cause mortality was observed among fathers living with their children and a partner. Singlehood, never having had children, and not living with one's biological children had negative impacts on longevity.

In summary, the effects of marital status on health are confounded by other indicators of social position such as parental status, living arrangement (the presence of an adult and/or children in the household), and socioeconomic status. An analysis that does not unravel these characteristics can lead to misleading conclusions about the extent and nature of differences in health. The few studies with designs that allow the disaggregation of effects show that permanent childlessness has a negative impact on longevity independent of marital status and socioeconomic status. Given the nature of the data sets with which they work, researchers in the marital status health differentials tradition tend to focus on establishing effects, rather than investigating potential mechanisms. Analyses of differences in morbidity and mortality should consider not only sociostructural states but also determinants in daily living such as stress, health practices, and access to support and care.

Multiple Roles

A third body of research views parenthood as one of the multiple roles people might occupy. The focus is on having the responsibility for children as they grow up, typically measured as having children in the home. A drawback of this measure is that empty nesters and people who have not (yet) become parents fall into the same category. The aim of this line of research is to find out whether it is harmful or beneficial to combine the roles of parent, spouse, and paid worker. Most of the research has focused on women; however, increasingly, men are being included in research designs (Arber, 1991; Hibbard & Pope, 1991; Mastekaasa, 2000). As Macintyre (1992) pointed out in her review article, there are many more studies of the health effects of parenthood and employment among women than among men, presumably at least in part because "being employed and a father are seen as normative and unproblematic" (p. 461).

Competing hypotheses have been put forward regarding the effects of multiple roles on health (Marks, 1977; Sieber, 1974). Are they a "double burden" or a "double blessing" (Weatherall, Joshi, & Macran, 1994)? The role strain

hypothesis (Marks, 1977) suggests decreased well-being, given the demands of incompatible roles. For example, role overload may result from accumulating too many responsibilities given available time and energy. *Role conflict* describes the difficulties involved in attempting to meet competing or contradictory expectations and obligations, irrespective of time pressures. The idea is that role overload and role conflict result in fatigue and exhaustion and ultimately contribute to disease and death. The role accumulation (Sieber, 1974) or role expansion hypothesis (Marks, 1977), on the other hand, suggests increased well-being resulting from multiple roles. People fulfilling multiple roles gain sources of self-esteem and identity. Employment has the benefits of providing financial independence and access to social contacts outside the home and marriage. Presumably, role accumulation includes improved coping resources, a healthier lifestyle, and better disease resistance.

The empirical evidence favors the role accumulation hypothesis: The health of women who are married, who have children, and who are employed is good compared to other groups of women (Arber, 1991; Fokkema, 2002; Hibbard & Pope, 1991; Martikainen, 1995; McMunn, Bartley, Hardy, & Kuh, 2006; Verbrugge, 1983; Waldron, Weiss, & Hughes, 1998; Weatherall et al., 1994). Note that the effects of multiple roles are not of primary interest to us. Instead, we focus on what we can learn from these studies about the role of parenthood specifically and its links with health.

Verbrugge (1983) was among the first to examine the singular and combined effects of marriage, parenthood, and employment on health. Using a wide range of subjective and objective health measures, she analyzed data from the 1978 Health in Detroit Study, a sample of White men and women age 18 and older. Defining *parent status* as having one or more children in the home, Verbrugge found that parenthood had the weakest health benefits, whereas employment had the strongest. Each role in and of itself contributed positively to health. The combination of roles conferred no special additional health advantage or disadvantage. The health benefits of marriage, employment, and parenthood were similar for men and women. Given the cross-sectional nature of the data, Verbrugge was unable to unravel selection and causation effects.

Another study, which also included men, was carried out by Hibbard and Pope (1991). Their data were from a 15-year follow-up of a sample of members of a large Health Maintenance Organization (HMO) in the United States who had been studied in 1970 to 1971. Hibbard and Pope controlled for self-reported health at baseline to deal with the problem of the "healthy worker" effect (i.e., the possibility that healthier people were more likely to

enter the workforce and stay in it). Parental status, measured as having one child or more younger than age 19 in the home, was unrelated to any of the morbidity and mortality measures among men. Among employed women (controlling for marital status), having no children at home increased the risk of ischemic heart disease but had no effect on other serious morbidities or on all-cause mortality. Among nonemployed women (controlling for marital status), parental status had no association with death or morbidity.

Although Hibbard and Pope (1991) reported few links between parental status and health, Martikainen (1995) showed, in a 5-year follow-up of Finnish women who were age 35 to 64 at the time of the 1980 census, that mortality for most cancers, vascular diseases, "other" diseases, and accidents and violence was higher among women who had no children at home than mothers. This parental status difference remained after controlling for marital status, labor force participation, occupational status, and educational attainment.

A study by Weatherall et al. (1994) is unusual in the multiple roles literature because of its focus on ever having had children rather than having children at home. Using a British database that matched 1971 census records and death records, they found higher mortality risks for childless women and for women whose youngest child was age 15 and older among married women younger than age 60 in 1971. No interaction with employment status was observed. In addition, they demonstrated health selection into motherhood in an analysis that matched data from the 1971 and 1981 census returns. Age-adjusted mortality was highest for women who were childless at both time points, and it was markedly lower for women who became mothers for the first time in the interval between the two censuses. The authors conclude that "health problems, which are later manifest as mortality, may bar entry to motherhood" (p. 295).

Elstad (1996) examined changes over time in the effects of multiple roles on women's health, as indicated by having any long-standing diseases. He used data from five national surveys conducted by Statistics Norway between 1968 and 1991, focusing on women age 31 to 60 at the time of data collection. Parental status was measured as having at least one child younger than age 17 in the household. This measure excluded noncustodial children but included stepchildren. Those who had more children had fewer health problems. Whereas this relationship had not changed over time, the effect on health of having no children at home and being in full-time employment did. The negative effect observed in the older data had disappeared in the surveys conducted in the late 1980s. In Elstad's view, this finding suggests an increased importance of paid employment in women's lives. He argued that

paid employment appears to be protective of health, even when women have other characteristics that usually confer health disadvantage, such as being childless. Elstad also drew attention to health selection into work, arguing that good health has possibly become a more explicit criterion when women enter paid employment.

The centrality of work orientation also emerged in a more recent study using two Norwegian data sets (Mastekaasa, 2000). Both of these cross-sectional samples were restricted to employed 18- to 59-year-olds, and health was measured in terms of sick leave. Parental status was indicated by the number and ages of children. Only children younger than age 16 were considered. In the first data set (1995 national registry data of employment relations), involving a sample of married men and women, he found few parental differences. The few observed differences pertained to parents of infants, who were more likely to be absent from work than the childless and parents of older children. Their sickness absence was largely because of respiratory conditions, probably involving infections contracted through their children.

The second Norwegian data set was formed from the 1990 census supplemented with information from public registers. Married, cohabiting, never-married, and previously married single women were distinguished. Sick leave was low among single never-married childless women, a group that might be particularly committed to work. Sick leave was relatively high among young married women, a group that might be particularly family oriented and correspondingly less work oriented. In this sample of Norwegian women, work orientation appears to be the relevant determinant of health rather than marital or parental status.

In summary, the picture that emerges from these studies is that women who have no children at home tend to have poorer health. Parental status appears to make less of a difference in terms of health than does employment status. Among the limitations of this research for gaining insight into the effects of childlessness on late-life health are that (a) lifelong childlessness and no longer having children living at home are confounded, (b) there is a focus on women in midlife and so one learns little about men and about older women, and (c) apart from the issue of selection versus causation, little insight is provided into the mechanisms that might underlie the salutary effects of parenthood.

Social Networks

In our view, it is useful to turn to the social networks literature for insights into how and why parenthood might affect health. Large, well-controlled

prospective studies have repeatedly shown that social relationships have an impact on health independent of potentially confounded factors such as *socio-economic status*, *prior health status*, *use of health services*, and *personality* (Uchino, 2004). There are several pathways by which social relationships are posited to affect well-being (Berkman, Glass, Brissette, & Seeman, 2000). The first is through social support, which involves behavioral exchanges (giving and receiving) that are intended as helpful and are perceived as such. Second, networks provide opportunities for social engagement and companionship. Shared leisure activities serve as a source of pleasure and stimulation, whereas the participation in meaningful community activities brings social recognition and feelings of belonging. Social control is a third mechanism that operates directly on health when network members consciously attempt to modify a person's health behavior or indirectly when people internalize norms for healthful behavior. Fourth, relationships provide access to resources that transcend an individual's means. To have relationships is to have access to other people's connections, information, money, and time. A fifth pathway by which networks may influence health is by person-to-person contact resulting in disease transmission. The same network characteristics that can be health promoting can be health damaging if they serve to expose people to infectious agents.

We know that adult children serve several of the previously described functions in their aging parents' lives. In contrast to the "demands of parenthood" view that dominates the literature on earlier adulthood, the literature on late life emphasizes the "rewards of parenthood." Study after study has documented the centrality of adult children in the social networks of aging parents as providers of support, bridges to social services, monitors of health behavior, vehicles to new social circles, and so on (e.g., Choi, 1994; Kendig, 1996; Phillipson, Bernard, Phillips, & Ogg, 2001; Wenger, 1984; see also the article by Wenger, Dykstra, Melkas, & Knipscheer, 2007 [this issue]). The importance of adult children in older parents' lives has given rise to the question of what happens to older people who have no children on whom they can rely (Kreager, 2004; Wenger, Scott, & Patterson, 2000).

Generalizability of Findings to Older Adults

As the review of the literature has revealed, childless men and women generally have poorer health than parents, though the differences are small. Most of the findings pertain to midlife adults; little research has compared the health of older parents and nonparents. As yet, it is not clear whether parenthood differences in health also exist at advanced ages. Two issues are relevant here.

The first is whether parenthood differences that are observed in midlife will continue to exist in late life. There is the possibility that survival through midlife may lead to selection effects in which only the healthier individuals move into old age and progressively through later life. However, if marital status health differentials serve as an indication, there is reason to suspect that family variables will have continuing effects to the end of life. Even at very advanced ages, marital status has been found to predict longevity (Martelin, Koskinen, & Valkonen, 1998; Shye, Mullooly, Freeborn, & Pope, 1995). In their review article, Alwin and Wray (2005) pointed out that the literature is quite consistent in the finding that socioeconomic and sociodemographic inequalities in health persist across the life course. The cumulative advantages and disadvantages literature shows increasing disparities across social categories with increasing age (Crystal & Shea, 2003; Dannefer, 2003; O'Rand, 1996).

The second issue is whether findings based on younger cohorts can be generalized to older cohorts. More particularly, the question is whether the opportunities to enter marriage or parenthood have been similar for younger and older cohorts. Women born in the first decades of the 20th century faced relatively greater impediments to combining professional aspirations with family responsibilities. Those who remained unmarried at that time were relatively resourceful women (Bernard, 1982; see also the article by Hagestad & Call, 2007, part one of this special issue). The rise in women's employment has made men's role as principal providers for the family less important (Kalmijn, 1998; Sweeney, 2002). Successive cohorts have been more likely to marry and become parents during the course of the past century. This suggests that health differentials between the married and the unmarried, and between the parents and the childless, may have diminished.

Clearly, there are opposing views regarding the applicability to older people (and earlier cohorts) of findings from people in early and midlife showing marital and parenthood differentials in health. It remains an open question as to how differences in health between parents and childless individuals may accumulate through the life course and vary for successive cohorts.

Empirical Analysis of Health Differences

In the remainder of this article, we examine differences in health between older people with and without children. In addition to analyzing differences in physical and mental health outcomes, we look at the health behaviors that

may contribute to these outcomes. The focus on health behaviors is based on the notion that parents have been (and remain) subject to informal social control for much of their adult lives. Presumably, the influence of social control is evident in exhibited behavior, in this case, refraining from damaging health behaviors and engaging in a health-promoting lifestyle.

Several authors provided reasons why parents would have more healthful behaviors than childless individuals. One idea is that parenthood is a transforming event (Akerlof, 1998; Eggebeen & Knoester, 2001). When people become parents, their behavior changes. They act more responsibly, become more caring, and wish to be good role models (cf. Backett & Davison, 1995). Another idea is that living with others (a partner, children) requires regulation of activities and a division of responsibilities and obligations (Umberson, 1987). Sharing a household implies being subject to informal pressure toward regularity of habits (Anson, 1989): sleeping times, meal times, and avoidance of adverse exposures imposed on others (e.g., smoking). Having day-to-day obligations toward others means people can less easily afford to enter the sick role (Gove & Hughes, 1979). Older people report that spouses and adult children are positive influences that facilitate physical activity, social activity, and healthy eating (Kendig, 1996).

The links between health behaviors (e.g., smoking, alcohol consumption, regularity of meals, sleeping habits, exercise) and health outcomes have been examined extensively elsewhere (Belloc & Breslow, 1972; Berkman, Breslow, & Wingard, 1983; Camacho & Wiley, 1983; Huijbregts et al., 1997; Joung, Stronks, van de Mheen, & Mackenbach, 1995; Wyke & Ford, 1992). Here, we restrict ourselves to the first part of the causal chain, from sociodemographic predictors to health behaviors. The second part of the causal chain, running from health behaviors to health outcomes, is not considered here.

Our working hypothesis is that compared to parents, childless individuals will have poorer physical and mental health and exhibit fewer positive and more negative health behaviors. Implicit in our thinking is that late-life health is a continuation of patterns established earlier in life. It is expected that the effects of family circumstances will be ongoing even after children have left the parental home.

Data Sources

We use survey data from three countries: Australia, Finland, and the Netherlands. Although the surveys were not designed to examine the impact of childlessness on late-life health, the data sets have comparable (though not identical) questions on relevant variables.

The Australian data are from two surveys, which were combined to obtain a sufficiently large number of childless older adults. We analyzed data from the first wave of the Australian (Adelaide) Longitudinal Study of Aging (ALSA), which was designed to assess how psychosocial, biomedical, lifestyle, and environmental factors are associated with health and well-being in late life. Respondents ($N = 1,947$) were between the ages of 70 and 85 at the time of the first interview. The sample was drawn from the State Electoral Data Base (with a response of 60%), stratified by gender and 5-year age bands, and included community-dwelling and institutionalized individuals. Wave 1 (1992-1993) included a comprehensive face-to-face interview using computer-assisted interviewing, a physiological assessment, and self-completion questionnaires. Details on the study can be found in Andrews, Cheok, and Carr (1989) and in Andrews and Myers (2000).

The second Australian data set is from the Health Status of Older People (HSOP) survey, which was conducted in the Melbourne metropolitan area in 1994. Questions in the survey concentrated on the following topics: health-related actions, health history, functional health, perceived quality of life, service use, transport, and neighborhood. The survey instruments included a face-to-face interview, a brief physical examination, and a self-completion questionnaire. Respondents ($N = 1,000$) were age 65 and older at the time of the interview and were living in private dwellings. The response rate was 70% for full interviews. Details on the study can be found in Kendig et al. (1996).

The Finnish data are from the 1994 Survey of Living Conditions in Finland (SFLC), which was part of a series of periodic surveys carried out by Statistics Finland on the living conditions of noninstitutionalized adults. Personal interviews were conducted with people age 15 and older ($N = 8,650$). The systematic random sample was stratified by home municipality, occupational class, and income. The response rate among persons age 55 to 74 was 73%, and 66% among those age 75 and older. The analyses reported in this article are based on the 1,551 respondents who were age 65 or older at the time of data collection. Background information on the survey is provided in Ahola, Djerf, Heiskanen, and Vikki (1995) and on the Web site of Statistics Finland (<http://www.stat.fi/>).

The Dutch data come from the first wave (1992-1993) of the Longitudinal Aging Study Amsterdam (LASA). The purpose of LASA was to gain insight into the predictors and consequences of changes in physical, cognitive, emotional, and social functioning in older persons. The sample, which was stratified by gender and 5-year cohort bands (1908-1937 birth cohorts), was drawn from the population registers of the city of Amsterdam and two

rural communities in the western part of the Netherlands, one city and four rural communities in the south, and one city and four rural communities in the northeast. Older adults in private households and in institutions were included in the sample. Respondents ($N = 3,107$) were between the ages of 55 and 85 at the time of the interview. The analyses reported in this article are based on the 2,141 respondents age 65 and older. Face-to-face interviews were conducted using laptop computers. Respondents also filled in a self-completion questionnaire, and a separate visit was made by a nurse-interviewer for clinical measurements. The response rate was 51% for the interviews. More detailed information can be found on the LASA home page (<http://www.lasa-vu.nl/>) and in Deeg and Westendorp-De Serière (1994).

Analyses

Three sets of health outcomes were considered to examine the influence of marital and parenting experiences. We selected measures that were highly similar across the surveys. The first set pertained to physical health and included self-rated general health a rating of one's health compared to peers, functional capacity, pain, and the use of prescription medicine. The second set pertained to mental health and included measures of depression and difficulty of falling asleep. The third set pertained to health behaviors (fruit consumption, smoking, alcohol consumption, and physical exercise).

To avoid what Connidis and McMullin (1993) referred to as the "all-or-nothing" approach to research on the impact of parent status in older age, where differentiations among childless individuals and among parents are overlooked, we separate the effects of parental and marital status. Respondents were categorized as childless if they had no living biological or adoptive children. Three marital status categories were distinguished: never married, formerly married, and currently married. The "currently married" category included a small number of individuals in consensual unions. Given the small numbers of divorcées, they were combined with widows into a "formerly married" category.

Findings are presented separately for men and women, in each of the marital and parenting groups, given the potential influence of gender on health status (see Table 1 for the numbers of Australian, Finnish, and Dutch respondents in each of the groups). The article by Koropeckyj-Cox and Call (2007 [this issue]) shows that in these data sets relatively more men are currently married and relatively more women are either previously married or never married.

The analyses applied controls for age and educational attainment given their potential to independently affect health and their importance for selection into the marital and/or parental status categories. The level of educational

Table 1
Mean Age and Years of Education of Older Adults in Three Countries, Categorized by
Gender and Parental and/or Marital Status

	Childless Men			Fathers			Childless Women			Mothers	
	Never Married	Formerly Married	Currently Married	Formerly Married	Currently Married	Never Married	Formerly Married	Currently Married	Never Married	Formerly Married	Currently Married
<i>N</i>											
Australia	56	31	66	322	1,048	66	70	57		596	774
Finland	41	19	41	104	413	92	54	28		484	274
Netherlands	56	34	76	208	674	79	70	55		497	392
Age											
Australia	74.3	80.4	78.3	80.7	75.8	80.5	79.7	76.2		78.5	73.8
Finland	69.4	73.6	69.5	71.1	68.4	73.1	77.1	69.5		73.4	67.6
Netherlands	80.0	78.0	70.7	74.8	69.7	72.2	75.7	68.5		74.3	66.8
Years of education											
Australia	8.9	8.5	8.8	8.0	9.0	9.7	9.1	9.1		8.9	8.7
Finland	6.6	6.1	7.2	6.1	7.7	8.0	5.1	7.2		5.8	7.4
Netherlands	8.6	8.0	10.2	8.7	9.7	10.4	8.7	8.9		7.7	8.0

Source: 1992-1993 Australian Longitudinal Study of Aging (ALSA; see Andrews, Cheok, & Carr, 1989; Andrews & Myers, 2000) combined with the 1994 Health Status of Older People (HSOP) survey (see Kendig et al., 1996); 1994 Survey of Living Conditions in Finland (SFLC; see Ahola, Djerf, Heiskanen, & Vikki, 1995); and 1992-1993 Longitudinal Aging Study Amsterdam (LASA; see Deeg & Westendorp-De Serière, 1994).

attainment was measured in terms of the number of years that are generally required to complete a certain level of schooling. As Table 1 shows, the formerly married were generally older than the currently married. Never-married Australian women and never-married Dutch men also had reached relatively advanced ages. Among men, currently married fathers had the highest level of education, followed by those who were currently married and childless. Among women across the three countries, those who had never married and remained childless consistently had the highest level of education, followed by those who were currently married and childless. (Differences in educational attainment are described in greater detail in the article by Koropecj-Cox & Call, 2007.)

ANOVAs were carried out with parental status (has living children or not), marital status (never married, formerly married, and currently married), and gender as determinants. Age and level of educational attainment served as covariates. Health status was examined by means of one-way ANOVA using 10 gender/marital/parental status categories. Differences described in the text below are significant at least at the .05 level. In the tables, we present means adjusted for the effects of age and level of educational attainment. The findings are presented for five categories of adults: never married, formerly married and currently married childless older adults, and formerly married and currently married parents. In addition, they are presented separately for men and women and for the three countries.

Results

Physical Health

Table 2 shows differences in self-reports of physical health, adjusted for age and years of education. Across the three countries, few consistent differences were observed regarding the reports of poor (including "fair") self-rated health. In Australia and Finland, formerly married childless men were most likely to report poor health, whereas in the Netherlands they were least likely to report poor health. In the Netherlands, never-married childless men were most likely to report poor health, whereas this group reported favorably about their health in Finland. Among Finnish women, the never-married childless and currently married mothers were least likely to report poor health.

The next indicator of general health was whether respondents perceived they were fitter than age peers. The pattern of findings is quite similar for

Table 2
Physical Health of Older Adults in Three Countries, Categorized by
Gender and Parental and/or Marital Status (in percentages)

	Childless Men			Fathers		Childless Women			Mothers	
	Never Married	Formerly Married	Currently Married	Formerly Married	Currently Married	Never Married	Formerly Married	Currently Married	Formerly Married	Currently Married
General health										
Australia (fair or poor)	32	39	26	28	28	22	21	31	23	29
Finland (fairly bad or bad)	17	50	25	27	24	15	37	38	31	13
Netherlands (fair or poor)	42	11	18	28	31	34	31	35	42	36
Health compared to peers										
Australia (more fit)	46	69	54	62	62	66	69	45	56	54
Finland (no data)										
Netherlands (more fit)	21	67	24	38	33	28	27	18	31	29
Functional capacity										
Australia (no ADL problems)	79	83	92	83	68	62	75	67	47	68
Finland (no data)										
Netherlands (no ADL problems)	45	57	64	62	68	50	52	55	54	62
Pain										
Australia (no pain)	57	58	58	64	62	44	59	62	56	68
Finland (no pain)	42	36	45	35	34	30	30	61	37	29
Netherlands (no data)										
Prescription medicine										
Australia (yes)	89	84	87	82	82	86	81	92	83	87
Finland (yes)	60	86	95	71	67	80	82	85	81	76
Netherlands (yes)	73	59	56	63	63	70	70	66	70	65

Source: Please see Table 1.

Note: ADL = activities of daily living. The proportions are adjusted for differences in age and years of education.

Australia and the Netherlands. The favorable ratings of formerly married childless men stand out. Of all categories of men, they were most likely to perceive they were fitter than age peers. Never-married childless men were least likely to perceive they were fitter than their peers. Among women, currently married childless women were least likely to report they were fitter than their peers. This question was not in the Finnish survey.

Functional capacity, measured in terms of having no limitations with the activities of daily living (ADL), was the third indicator of general health. Finnish data on ADL limitations were not available. Findings were not consistent across Australia and the Netherlands. The Australian data showed a main effect for gender: Women were more likely to have ADL limitations than men. Of all the groups distinguished in the Australian analyses, currently married childless men were least likely to have ADL limitations, whereas formerly married mothers were most likely to have ADL limitations. In the Dutch data, using a less stringent measure, never-married childless men were least likely to have ADL limitations. Other differences between the groups in the Dutch analyses were not significant.

The absence of pain was the fourth measure of general health. Dutch data on pain were not available. In Australia and Finland, few differences across the distinguished gender/marital/partner status categories were observed. In the Australian data, never-married childless women stood out, with a high likelihood of reporting pain. In the Finnish data, currently married childless women were distinctly less likely to report pain.

The last measure of general health was the use of prescription medicine. Neither the Australian nor the Dutch data showed any significant gender, marital status, or parental status differences in the likelihood of using prescription medicine. Few significant differences were found in the Finnish data as well, with one exception: Never-married childless men were least likely to report using prescription medicine.

Mental Health

We turn next to our measures of mental health. As Table 3 shows, difficulty falling asleep was clearly more frequent among women than men. This pattern was observed in each of the three countries. In Australia and in the Netherlands, never-married childless women were less likely to report sleeping problems than women in other marital and/or parental status categories. In Finland, formerly married childless men were most likely to report difficulty falling asleep, whereas formerly married childless women in the Netherlands were the most likely to report sleep problems.

Table 3
Mental Health of Older Adults in Three Countries, Categorized by
Gender and Parental and/or Marital Status (in percentages)

	Childless Men			Fathers			Childless Women				Mothers	
	Never Married	Formerly Married	Currently Married	Formerly Married	Currently Married	Never Married	Formerly Married	Currently Married	Formerly Married	Currently Married	Formerly Married	Currently Married
Falling asleep	17	9	15	18	13	21	27	25	31	26		
Australia (trouble)	25	50	30	27	31	49	37	46	47	44		
Finland (difficulties)	15	15	22	15	10	19	35	23	25	23		
Netherlands (often difficulties)												
Depression												
Australia (above mean)	48	39	43	42	32	42	50	30	47	38		
Finland (yes)	8	57	30	34	28	37	41	46	42	33		
Netherlands (above cutoff)	25	23	8	21	7	18	19	14	23	12		

Source: Please see Table 1.

Note: The proportions are adjusted for differences in age and years of education. See text for differences in the depression measures.

Measures of depression differed between the surveys. In the Australian and Dutch surveys, depressive symptoms were measured using the Center for Epidemiological Studies Depression Scale (Radloff, 1977). In the Finnish survey, a one-item question assessed whether respondents felt low spirited or depressed. Being formerly married was associated with a greater likelihood of depression in all three countries. Consistent parental status differences and gender differences were not observed. Although never-married men were least likely to report depressive feelings in Finland, they were highly likely to do so in Australia. Formerly married childless men in Finland and formerly married childless women in Australia were also highly likely to report feelings of depression. Finally, currently married Dutch men, regardless of parental status, were unlikely to report depression.

Health Behaviors

The first indicator of positive health behavior was the daily consumption of fruit in winter (see Table 4), included in the Australian and Dutch but not the Finnish survey. In the Australian and Dutch data, a clear gender difference emerged: Men were less likely to eat fruit daily than women. In both countries, formerly married fathers were least likely of all to consume fruit on a daily basis in winter. In the Netherlands, never-married men were also unlikely to eat fruit daily.

Each survey included information on smoking behavior. Gender and marital status differences were found in Finland and the Netherlands but not in Australia. Overall, Australians were least likely to report being current smokers. In Finland and the Netherlands, men were more likely to be current smokers than women, and the unmarried were more likely to be current smokers than the married. In both countries, parenthood differences in the likelihood of being a smoker were observed; however, the pattern differed by gender. In Finland, childless men were more likely to be smokers than fathers, whereas in the Netherlands, childless women were more likely to be smokers than mothers. In all three countries, the likelihood of being a current smoker was highest among never-married childless men.

The fourth health behavior considered in the analyses was the daily consumption of alcohol. Daily alcohol consumption levels were quite similar in Australia and the Netherlands but much lower in Finland. Policy restrictions (the state has a monopoly on the sale of alcohol) might account for why Finnish older adults are less likely to drink alcohol daily than Australian and Dutch. In each country, men were more likely to consume alcohol daily than women. In Australia, high rates of daily alcohol consumption were also observed

Table 4
Health Behaviors of Older Adults in Three Countries, Categorized by
Gender and Parental and/or Marital Status (in percentages)

	Childless Men			Fathers		Childless Women			Mothers	
	Never Married	Formerly Married	Currently Married	Formerly Married	Currently Married	Never Married	Formerly Married	Currently Married	Formerly Married	Currently Married
Fruit consumption in winter										
Australia (daily)	62	65	60	49	64	80	75	57	69	76
Finland (no data)										
Netherlands (daily)	49	64	52	48	63	87	79	87	81	75
Current smoker										
Australia (yes)	15	8	8	12	8	8	13	9	10	7
Finland (yes)	53	31	29	26	20	4	0	0	9	6
Netherlands (yes)	50	47	27	47	30	19	35	13	20	12
Alcohol consumption										
Australia (daily)	33	34	37	30	37	17	18	36	17	20
Finland (daily)	17	7	10	2	5	0	0	0	3	1
Netherlands (daily)	29	56	41	41	31	13	18	17	15	17
Walks outdoors										
Australia (no difficulty)	83	89	79	82	82	70	77	68	68	75
Finland (no difficulty)	73	57	86	74	86	67	61	61	62	89
Netherlands (yes)	55	65	90	78	98	82	70	78	75	88
Sports/physical exercise										
Australia (sports regularly)	12	43	32	27	25	11	12	11	13	12
Finland (yes physical exercise)	83	57	85	74	73	79	44	54	64	75
Netherlands (sports last 2 weeks)	28	29	51	41	59	49	41	54	68	68

Source: Please see Table 1.

Note: The proportions are adjusted for differences in age and years of education. See text for differences in the depression measures.

for currently married childless women. Finnish childless men were most likely to report the daily use of alcohol, particularly if they were never married. In the Netherlands, formerly married men, regardless of parental status, were more likely to report daily use of alcohol than currently married men. Among Dutch men, a parental status difference in daily alcohol consumption was also observed: Ever-married childless men were more likely to report the daily use of alcohol than ever-married fathers.

Two physical activity indicators were used. The first was whether the older adult walked outdoors (which can also be viewed as a measure of functional capacity). The second was a direct question about engaging in sports or physical exercise. In each country, women generally were less likely than men to walk outdoors; however, there were variations by parental and/or marital status. Finnish and Dutch formerly married men were less likely than currently married men to walk outdoors, particularly if they were childless. In Finland and the Netherlands, currently married mothers were most likely of all groups of women to walk outdoors. In the Netherlands, a high likelihood of walking outdoors was also observed for never-married women.

Questions regarding sports or physical exercise differed between the countries, which might account for the differences in overall patterns. Australian respondents were least likely to report engaging in sports or physical exercise (a restrictive measure was used). Australian men were more likely to report being physically active than Australian women, with the exception of never-married childless men who were particularly unlikely to engage in sports. A gender difference was not observed in Finland or the Netherlands; instead, parenthood rather than gender or marital status accounted for differences in physical activity. Finnish and Dutch formerly married childless men were unlikely to engage in sports or physical exercise. Among the Dutch, this was also the case for never-married men. Childless women in the Netherlands were less likely to engage in physical exercise than mothers. In Finland, this was so for ever-married childless women, not for the never married.

Summary and Conclusion

We used survey data from three countries to examine parental status differences in late-life health in conjunction with gender and marital status. The findings in old age show outcomes that reflect accumulating life course experiences since childhoods dating back to the early 20th century. Thirteen measures, which were sufficiently similar across the surveys to warrant comparisons, were incorporated in the analyses. They pertained to general

health, mental health, and health behaviors. All analyses of health differences between the groups applied controls for age and education differences. Results showed a number of consistent patterns across measures and across countries.

First, marital status differences in health provide a context in which to consider the importance of parenting status. The Australian and Dutch data showed that never-married men (and to some extent formerly married men) had relatively poor health status compared to their currently married counterparts in terms of physical health (general health and own health compared to that of peers), depression, and several of the health behaviors (daily fruit consumption, smoking, physical exercise). Previous authors have described never-married men as having few resources (e.g., Bernard, 1982; Kiernan, 1988; Wenger, 2001); however, the findings here emerged after controlling for education, suggesting an independent marital status effect on men's health. The different pattern in the Finnish data, with never-married men having favorable scores on several health measures, may have arisen because residents of institutions were not included in the sample. Previous research has demonstrated that never-married older adults are overrepresented in homes for the elderly and care institutions in all three countries (Finne-Soveri & Noro, 2000; Harmsen, Keij, & Schapendonk-Maas, 2001; Kendig, 2000).

Second, few effects for parenthood were found independent of marital status. Where they were observed (and this was the case in Finland and the Netherlands), they pertained to health behaviors, and more particularly smoking, alcohol consumption, and engaging in physical exercise. Our results thus provide evidence for the social control function of parenthood: Becoming a parent or having adult children means that people refrain from health-compromising behavior either because they have internalized norms to do so or because they are explicitly admonished by others to do so. It is unclear why parenthood effects were not observed in the Australian data. Smoking rates were low in that country, allowing for little differentiation, and gender rather than parental and/or marital status accounted for differences in alcohol consumption and engaging in physical exercise.

Third, the results showed that the health of formerly married men was particularly poor if they were childless. This pattern was observed for several of the health measures (but not always in all three countries): general health, difficulty falling asleep, depression, walking outdoors, and engaging in physical exercise. Apparently, the loss of the spouse has a more detrimental impact on health and health behaviors if men are childless than if they are fathers.

Fourth, parental and marital status differences in health, insofar as they existed, were greater among men than among women. Earlier we noted the relatively poor health of never-married men and that of formerly married men. Among women, no parental and/or marital status group emerged as having consistently poor or consistently good health across the various measures. This may suggest that the social control effects of having a spouse or a child have a stronger effect on men than on women. Overall, gender differences were reasonably consistent across the three countries. Women were more likely than men to have difficulty falling asleep, to eat fruit on a daily basis in winter, and to refrain from smoking and drinking.

Research Directions

This article has aimed to provide an integrated review and some analysis of the effects of parenting—independent of marital status and gender—on health throughout the life course. Our comprehensive literature review in the first part of the article showed that previous studies shed some light on the topic; however, the research base is limited. Available studies in the international literature seldom disentangle the effects of parenting from marital history. Most are limited by cross-sectional research designs that cannot separate selection and causal effects and do little to examine the mechanisms by which parenting may influence health. Many studies are conducted only for women, and the few that relate social and biological factors focus almost entirely on pregnancy and childbirth. The few available longitudinal studies also are limited to specific groups, such as women after childbearing, and they generally are conducted over relatively short periods of time.

Our comparative analyses of health in later life have presented new evidence that attempts to separate the impact of parenthood, marital status, and gender as they have accumulated throughout the life span and influence late-life health. Our analyses have their limitations, however. One problem is that data collected among older adults are inevitably riddled with misleading selection effects: People with the most health difficulties are less likely to reach old age or, if they do survive, to be able to participate in a lengthy interview. We have no information on those who did not make it to old age. Another problem is that our sample sizes are too small to fully investigate the likely interaction effects among our key variables. For example, it appears that the effects of parenting and being married are particularly influential among men; social class may also be important (Arber, 1991; Kendig, Browning, & Teshuva, 1998). We do not know if the differences between the three countries arise from sampling artifice or genuine social structural differences.

We commend the value of bio-psycho-social and life course perspectives (Ryff & Singer, 2005; Sauvain-Dugerdil, Leridon, & Mascie-Taylor, 2006) for further research on the influence of marital status, childlessness, and health as people move through adulthood into late life. A life history framework is especially valuable for identifying the critical influences and possibly enduring effects of family events such as marriage, divorce, and widowhood, as well as childbirth, coresident parenting, the departure of children from home, and ongoing interaction with them afterward. With the emergence of chronic disease and mental health as major health concerns for the future (World Health Organization, 2005), we need to know more about the "trigger points" and durations of health-risking and health-promoting exposures throughout the life course. Understanding family influences on health has potential to identify opportunities and guide actions that can improve health in later life (Kendig, Browning, & Wells, 1998).

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